



Fact Sheets and Information Papers

Used Photographic Fixer Sampling

January 2004

The following is based on Federal criteria. State criteria may be more stringent.

1. BACKGROUND: Photographic fixer removes the unexposed silver compounds from the film during the developing process. The spent fixer can have as much as 2000-3000 parts per million (ppm) of silver. Silver bearing waste is regulated by the Resource Conservation and Recovery Act (RCRA) as a hazardous waste if the level of silver exceeds 5 ppm as determined by the Toxic Characteristic Leaching Procedure (TCLP) test (40 CFR 261.24).

2. SILVER RECOVERY UNITS: Silver recovery units are used to reclaim the silver from the used fixer waste stream. The two main types of recovery units are active and passive units. The active unit uses electricity to plate silver onto an electrode. One type of passive unit uses a chemical reaction between steel wool and silver to plate out most of the silver from solution. Another type of passive unit is an ion exchange resin which acts as a filter for removing silver ions from the waste stream. None of the methods remove all of the silver.

3. TESTING: The effluent from the silver recovery process must be tested before it can be discharged to the sanitary sewer. If your installation has a Federally Owned Treatment Works (FOTW), then you must test the effluent as it comes out of the silver recovery unit. The regulatory limit for silver discharged to a FOTW is 5 ppm (40 CFR 261.24). If your installation discharges to a Publicly Owned Treatment Works (POTW), then a sampling point must be determined by coordinating with the Post Environmental Office and the POTW. The level of silver that may be discharged to a POTW varies depending on where the sampling location is and what pretreatment standards the POTW has.

4. FREQUENCY: In general, sample the effluent once a quarter for the first year then once a year there after. The first year should be used to tweak the silver recovery system to determine the proper feed rate and maintenance schedule for changing the electrodes and/or passive cells. If a test result exceeds the limit for your situation, the effluent should be containerized and managed as a hazardous waste until the problem is corrected and another sample taken. If the result from the later sample is below the regulatory threshold, the effluent would no longer have to be managed as a hazardous waste. The recommended sampling frequency should be maintained however.

5. SAMPLE COORDINATION: Sample analysis should be done by an accredited laboratory. If one is not readily available, coordinate with the Post Environmental Office. If they are unable to help, contact the U.S. Army Center for Health Promotion and Preventive Medicine (See paragraph 8 for telephone numbers) for assistance.

6. SAMPLE COLLECTION: Samples should be collected in clean glass jars of at least 500 ml capacity with a Teflon lid liner. For installations that have a FOTW, samples should be collected

while waste is being generated. Start taking the sample after the effluent has run long enough to purge the tube between the silver recovery unit and the drain. Once the sample has been taken, send the sample promptly to the accredited laboratory in packaging that has cushioning to prevent breakage and secondary containment in case it does break. Contact the Post Environmental Office for guidance and assistance with sampling when discharging to a POTW.

7. ANALYTICAL PARAMETERS: The TCLP test for silver should be run on the samples. Since the samples are a liquid, the extraction part of the TCLP test need not be done. The analytical value obtained will provide the necessary information to make a hazardous waste determination (hazardous waste if ≥ 5 ppm silver).

8. Sampling coordination can be done by contacting the following offices:

USACHPPM North (Fort Meade, MD) DSN 622-3668 or commercial (301) 677-3668 if your activity is in CT, DE, DC, IN, KY, MA, ME, MD, MI, NH, NJ, NY, NC, OH, PA, RI, VT, VA, or WV.

USACHPPM South (Fort McPherson, GA) DSN 367-3235 or commercial (404) 464-3235 if your activity is in AL, AR, FL, GA, LA, MS, OK, Panama, PR, SC, TN, or TX.

USACHPPM West (Fort Lewis, WA) DSN 347-0069 or commercial (253) 966-0069 if your activity is in AK, AZ, CA, CO, ID, IL, IA, KS, MN, MO, MT, NE, NV, NM, ND, OR, SD, UT, WA, WI, or WY

USACHPPM Europe (Landstuhl, Germany) DSN 486-8942 if your activity is in Europe, Asia Minor, or Southwest Asia.

USACHPPM Pacific (Camp Zama, Japan) DSN 315-263-8551 if your activity is in Alaska, Hawaii, Japan, or Korea.

***Hazardous and Medical Waste Program, Mr. Richard Price
5158 Blackhawk Road, ATTN: MCHB-TS-EHM
Aberdeen Proving Ground, MD 21010-5403
(410) 436-3651, DSN 584-3651***

[Back to Fact Sheet Index](#)